THE BENEFITS OF PROJECT EVALUATION TO IDRC AND AFNS

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This is probably a good point in time to consider project evaluation and resource allocation more closely. The IDRC budget is rapidly increasing towards the five percent of the Canadian aid program that was mentioned by Mitchell Sharp as a desirable goal for IDRC. The likelihood of a levelling off in the total IDRC budget will impose a more severe budgetary constraint on each Division. At the same time, AFNS can expect an increasing demand on Division funds for a number of reasons. The reputation of IDRC will continue to increase, AFNS officers will continue to examine new project proposals, inflation in Canada and the developing countries will continually erode the real growth in the Division budget and more Phase II projects will be undertaken. AFNS will have to adopt an increasingly selective approach to project support.

This draft paper presents the case for initiating a more systematic evaluation of research projects in terms of: i) selecting between competing research activities, partially on the basis of some kind of cost benefit analysis; ii) choosing the optimum scale of any research activity and minimizing the cost of any given project and; iii) evaluating the degree of success in a research activity. The objective of an evaluation system would be to maximize the social and economic benefits to developing countries from research programs supported by IDRC.

Investment decisions in the past, in both production and research, were usually made in isolation both of their ultimate effect and of the relative desirability of different investment possibilities. Even when projects were selected with regard to alternative possibilities and opportunity costs, the decision was usually based on internal or private rates of return as in the case of the IBRD. Social and external economics were not considered. However, the theory of resource allocation has advanced considerably in recent years and resource allocation theory has become a factor in most investment decisions today.

Fortunately for those people who believe that a common sense approach

is superior to economic jargon and the tools of economic analysis (the assumption being that the two are not closely related), the science of resource allocation and management in research is still fairly primitive. This is an extremely difficult type of activity to evaluate because there are so many qualitative factors involved even in the applied research field. There is a growing interest, however, in regulating the type and scope of research activities if for no other reason than that resources devoted to research are absorbing an increasing share of the GNP in most areas of the world.

Theory

As already stated, there is still no satisfactory system for research evaluation although there have been an increasing number of experimental models. In common with most types of public funding for public activities, there has been a general trend to a "planning" approach based on some form of a planning-programing-budgetary (PPB) system. Budgeting control in the form of close scrutiny to provent misuse of funds was initially emphasized. Then there was a "management" element added which focused on the efficient performance of work. The third stage, planning, has its roots in Keynesian economics and systems-analysis technology. It has focused on providing data on costs and benefits of alternate ways of achieving stated objectives and secondly on measuring output to facilitate achievement of objectives. This approach of measuring the most efficient research package for attainment of stated and specific objectives is probably the farthest advanced. The U.S. Department of Agriculture's Agricultural Research Service has revised about half of its research program into technological objectives with about one tenth of these programs analysed in a way that can be used for decision making. There is a lot of criticism of this approach however with many arguing that research projects classified with a low priority are simply misclassified! Other approaches (such as the California Academic - Responsive Budgeting System, the Iowa Review Panel and the computerized MARRIAS system in Minnesota) have had only limited effectiveness.

The private sector, which has very successfully used quantitative

techniques for capital investment programs, production scheduling and inventory policy, has also had very limited success to date in applying these to R and D.

An Evaluation System for AFNS

As there is not yet any accepted quantitative system of research evaluation which could be adapted to our purposes, a system will have to evolve here unconsciously if not consciously. In any case, quantitative methods will represent only an additional tool to use when making the political decision to support any given project.

Any attempt to quantify the ultimate costs and benefits of any research activity is obviously going to be difficult to develop. The real effects of any project may be very long run or indirect in its effect. Project results are likely to be mixed, including both positive and negative effects. A new crop may increase average rural income as well as the variations in income between groups and overtime. A project may have beneficial effects on the development of new knowledge or the attitudes of the scientific staff although it fails to achieve its technical objectives. Thus it will be necessary to specifically consider and quantify wherever possible the socio-economic as well as the technical objectives.

Grantee Contribution

An additional complication facing an institution like IDRC is the fact that it usually only funds a proportion of the total research costs. It is difficult not to consider only IDRC's contribution on the cost side of the ledger whereas the real benefits of any project should be considered against the total research cost. The effect of considering all project costs would be to not only reduce the potential rate of return from all projects, but increase the relative desirability of projects with a greater proportion of IDRC funds over those with a small IDRC contribution. On the other hand, the AFNS policy to fund restricted core programs means that IDRC's contribution may represent most of the real costs of a research project since IDRC often provides most of the variable costs of a project. The capital and land

provided by the recipient may have been under utilized if the project was not undertaken and thus its effective cost may be very low. The implication of this idea is that IDRC should continue to be receptive to project proposals in which a marginal contribution relative to the total research activity of the recipient could have a marginally large benefit.

A criticism which might be leveled against a quantitative AFNS evaluation system could be an apparent contradiction between this system and IDRC's philosophy of allowing the developing countries to establish their own priorities. However, it would only systematize what is already being done: selection of the most desirable projects from among those proposed to AFNS. Any evaluation system has the potential to offend the sensitivities of both the developing countries and the research institutions in these countries. Therefore, certain factors would have to continue to be discreetly considered.

Project Selection

A number of IDRC guidelines have already been established which help to provide a framework for project evaluations and discrimination between projects. Preference is given, most generally, to rural research particularly in the semi-arid tropics, to rural research benefiting the poorest sectors of the rural population in the semi-arid tropics and so on. Within these general policy guidelines project selection is made on the basis of personal assessment and the project proposal and budget. The list of questions presented below should be answered, wherever possible, in a project proposal.

Project Proposal

1. Why is the project important?
   Is it a priority for the country, the government?

2. Who will benefit and in what way? How soon could the results of this research project benefit the rural population?

3. What previous research has been done in this area and what is the relationship of this research to previous research? What coordination and co-operation will there be between this research project and other similar

research work being conducted elsewhere?

4. What are the expected obstacles to success in this research and the probability of success?

5. What other research work would be needed to allow successful application? Is there a systematic approach to the whole topic of which the research project is one facet? What would be the spin-off effects or second generational problems of a successful application to the rural community?

This format would allow some quantitative analysis and the use of limited cost benefit ratios based on the probability of success and the ultimate value of any project on the rural population. These questions are probably already considered in personal evaluation but inclusion in a project proposal would certainly encourage the applicant to keep the ultimate purpose of his research in mind - the welfare of the farmer, fisherman or forester.

A second advantage of specifying the ultimate effect of a research project in a proposal would be the possibility of a comparison between projects on a vertical rather than a horizontal basis. Presumably, it is to compare projects within one specific discipline and within one stage of an agricultural problem than it is to trace the potential impact of two projects in different fields through from basic research to outreach to the farmer. An examination of the vertical effects of a project bringing in other related research requirements at different stages of an agricultural innovation would encourage a stronger focus on the ends and not the means of agricultural research. It would allow both AFNS and the potential recipient to consider the whole system of innovation from production through processing, storage, marketing and consumer utilization.

Cost Minimization

The distinction between project evaluation using the tools of cost benefit analysis and budget control using the concept of cost minimization should be kept clearly in mind. Project evaluation involves the extremely

complicated problem of selecting those projects with the greatest benefit to cost ratio and then selecting the optimal size of the selected research activities. Budget control has the more simple objective of minimizing the costs of any given project of any given size. Having made the decision to support a study of a certain size, budget control can then be used to minimize the costs. A horizontal breakdown of projects in FY 1972/73 and 1973/74 is included as an appendix to this paper.

The limitations and the limited utility of this cost breakdown of AFNS projects should be clearly understood from the outset. A cost breakdown has only a limited reliability at this stage since there are so few projects to compare and the budget categories are not yet completely standardized.

Even more important than the accuracy of this data is the usefulness of the data. There is no wish to attempt to control ongoing projects or adjust the budgets of proposed projects largely on the basis of this or future average cost data. General budgetary analysis should rather be seen as a stimulus to a more critical evaluation by AFNS staff of new projects. That is, it should not be used to "straightjacket" future projects but to encourage AFNS staff to focus on unusual variations in budget components in order to satisfy themselves that project budgets are optimal.

The format of project budgets in AFNS is becoming more standardized and this obviously facilitates budgetary control as well as allowing more inter-project comparison. It might be helpful to supply a model budget (as well as the model proposal format already mentioned) to prospective grantees. The complication here would be the inducement this would offer to project applicants to fill in any categories they may have missed! The model presented below is almost identical to the format used in recent AFNS projects with the exception of a splitting of consultancies and advisory committees which represent a project input and information activity which is a project output. It should be possible to impose a substantial degree of standardization of costs per unit to project budgets. The only decision then would be an appraisal of the size of each overall category.

PROJECT BUDGET

I Operational

(a) Salaries and Allowances

(i) IDRC staff costs are already standardized at a total overall annual cost of $40,000 per person.

(ii) Senior LDC scientific staff costs per member are subject to some variation depending on the quality and necessity for certain individuals.

(iii) Junior scientific and other supporting staff should be generally categorized as x dollars per man month for each major group.

b) Consultants and Advisory Committees

AFNS has already established maximum and minimum per diem consultant allowances depending on quality.

c) Research Expenses

As research expenses form such a large part of project budgets, the grant applicant should be encouraged to provide a breakdown with some detail. Presumably it would be possible for AFNS to develop guidelines for individual components.

d) Travel

The applicant should be encouraged to elaborate very briefly on the purpose of the travel fund, particularly international travel as AFNS presumably would not want to provide travel funds for general international conferences, etc.

e) Training

Training costs could be standardized for international training with due allowance for length of course, air fares, etc.

f) Information

The relative share of the information budget would probably increase with Phase II's since more knowledge would presumably have been accumulated and there would be more information to disperse.

g) Supporting Services (Overhead)

A maximum contribution of 15 percent of project operational costs has been established.

II - Capital

Control of the capital budget is probably the most critical area for examination. It is extremely difficult for external evaluators to be able to accurately judge minimal project-related capital requirements in all cases. Barring some kind of standard guidelines, there are few alternatives. If future AFNS funds tend to be concentrated in fewer areas as network activities spread, the problem will become less serious. In important project proposals where the capital budget seems exceptionally high, it might be desirable to consult, on a confidential basis, a non-IDRC staff member with experience in the particular field or region.

III - Contingency

All approved projects in future will include a contingency allowance which may be as high as 10 percent of the operational costs (less expatriate staff) of a small project. This amount will be relatively reduced as the project increases in size. The maximum contingency for a budget over $200,000 was $17,000 or 8.2 percent of the total operating costs (less expatriate costs).

MODEL PROJECT BUDGET

OPERATIONAL

Salaries and Allowances (Labour)

IDRC staff
Senior scientific staff
Junior scientific
and other supporting staff

Consultants and Advisory Committee

Research Expenses

Materials and supplies
Cultural operations
Computer services
Vehicle maintenance and operation

Travel

Local
International

Training (incl. travel expenses)

Information
(workshops, seminars, publications, etc.)

Supporting Services (overhead)

CAPITAL

Field Equipment

Laboratory Equipment

Vehicles

Other

CONTINGENCY

Total

Continuing and Ex-poste Project Evaluation

An extremely important factor in any ongoing evaluation is the specificity of the original project objectives. A project may be considered successful despite its failure to meet any technical objectives but the more the expected qualitative changes are specified in the original project proposal, the easier it will be for the reviewing officer to relate the objectives to the results in a systematic manner. There may be certain factors such as a change in the attitude of the LDC research staff which would not be included in the LDC project proposal. However, they could certainly be considered as additional (confidential to IDRC) objectives when the project is considered. These objectives could then also be evaluated. The following general criteria represent some of the factors to be included in a project evaluation.

Evaluation Criteria

Effect on rural population;
Institutional change (attitude and procedure);
Technical progress;
Change in quality (attitude) and quantity (formal and in-service) of LDC scientific personnel;
Network creation.

NOTES ON THE COST BREAKDOWN OF AFNS PROJECTS

1. The cost breakdown in these tables is based on the approved budget allocations rather than the actual project costs for theoretical and practical reasons. One good practical reason is that we cannot dig out the relevant actual expenditures by category. However, a cost analysis should be based on the approved expenditures anyway since the actual level of expenditure in each category is a function of the approved budget and project-specific distortions rather than an optimal budget. The approved budgets, on the other hand, represent the best AFNS estimate of what the optimal budget for a given project should be. An analysis of the actual expenditure pattern in division projects could be useful, however, for such purposes as pinpointing bottlenecks in research activities in the developing countries or adjusting future project budgets, with similar variables, based on inaccurately approved previous budgets which are obviously over or under funded.

2. Table II shows the relative shares of each major expenditure category for all AFNS overseas projects. Since there are so many variations in project costs between disciplines, etc., Tables II-IV isolate one major exogenous factor in each table. A finer breakdown, removing two or more exogenous factors, is not possible until there are more AFNS projects. As it is, there are not yet enough projects to provide reasonably stable averages for each budget catetory.

3. Distortions caused by changing technology, uneven rates of price changes between factors, and changes in foreign exchange rates could be removed by an adjustment mechanism but these can probably be adequately considered at present in the personal evaluation of new projects by AFNS staff.

4. Table I(a) has several interesting points. The contingency allowance has been much lower in the past than the 10 percent allowance which is now going to be accepted as a more standard figure. If AFNS projects have not been running into serious financial difficulties up to the present, then the 10 percent figure seems fairly high. Perhaps it is not a serious problem as these funds would remain under IDRC control. It may mean that large projects would not have to be terminated earlier than originally planned.

Alternatively, it may be possible to reduce some of the other budget categories. Many projects probably cannot hire their full staff complement immediately upon commitment of the funds and thus the staff salary and allowance category need not be as large for the first year.

The most dramatic change in project budgets in the two fiscal periods is the decline in IDRC expatriate staff which is a welcome trend. This may be due to the increase in the relative share of large projects over $200,000 in this fiscal year. Unfortunately Table IV(b), a cost breakdown by size of grant for 1973/74, will not be available until the Monday meeting. The 1972/73 data in Table IV(a) does not indicate, however, that projects over $500,000 tend to have a lower expatriate staff requirement, although this is based on only two projects in that fiscal year. I will present the data on the trend to larger projects during the Monday meeting.

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Table I: Cost Breakdown of AFNS Projects in FY 1972/73 & FY 1973/74

1. (a) Overseas Projects (%)

	1972/73	1973/74
Expatriate	30	12
Total Operating (less Expatriate)	51	64
Capital	14	16
Contingency	5	3
	100	100

(b)

	1972/73	1973/74
Total Operating (less Expatriate)	78	80
Capital	22	20
	100	100

(c)

	Total Operating		Total Operating (less Expatriate)	
	1972/73	1973/74	1972/73	1973/74
IDRC Staff	36.6	15.6	-	-
Consultant	2.3	2.4	3.7	2.8
Senior Research Staff	4.8	14.7	7.6	17.5
Other Staff	13.5	17.3	21.1	20.6
Travel	5.2	9.8	8.2	11.6
Training	13.4	11.5	21.0	13.6
Information	1.1	1.5	1.8	1.7
Research Expenses	19.7	21.4	31.1	25.4
Supporting Services (Overhead)	3.3	4.4	5.3	5.2
Other	0.1	1.3	0.2	1.6
	100	100	100	100

2. Total Canadian AFNS Projects for both FY 1972/73 and 1973/74

	%
Staff	61.1
Research Expenses	10.8
Travel	5.1
Consultants & Publications	1.4
Supporting Services	7.9
Total Operating	86.4
Capital	8.4
Contingency	5.2
TOTAL AFNS GRANTS	100

3. Projected versus Actual Cash Flow in Overseas Projects

	FY 1972/73	FY 1973/74
Total	86.2	98.3

Table II: Cost Breakdown of IDRC Grants by Discipline

(a) 1972-73

	Total	Crops	Animals	Forestry	Farming Systems
IDRC Staff	29.6	29.4	8.7	12.7	46.0
Consultant	1.9	0.4	—	6.1	1.0
Senior Research Staff	3.9	4.1	—	7.8	3.7
Other Staff	10.9	15.4	43.9	—	1.5
Travel	4.2	5.7	5.5	4.3	1.9
Training	10.8	7.5	1.7	5.0	20.8
Information	0.9	0.8	0.6	2.3	0.5
Research Expenses	15.9	16.2	18.6	32.5	7.7
Supporting Services (Overhead)	2.7	3.8	8.8	—	1.0
Other	0.1	—	1.6	—	1.0
Total Operating Costs	81.1	83.3	89.5	70.7	84
Field Equipment	0.2	0.4	—	—	—
Laboratory	0.1	0.3	—	—	—
Other	0.1	0.3	—	—	—
Total Capital Costs	13.7	11.2	8.2	21.9	11.0
Contingency	5.4	5.6	2.3	7.7	5.3
TOTAL IDRC GRANT COSTS	100	100	100	100	100

Table II: Cost Breakdown of IDRC Grants by Discipline

(b) 1973-74

	Total	Crops	Fisheries	Animals	Forestry	Food & Nutrition Sciences	Farming Systems
IDRC Staff	11.9	18.6	16.3	-	-	-	9.0
Consultant	1.8	1.3	6.8	-	-	9.1	
Senior Research Staff	11.2	8.9	5.8	20.9	12.5	10.2	22.4
Other Staff	13.2	15.0	10.3	18.6	-	7.3	19.6
Travel	7.4	10.5	3.6	7.6	6.7	12.9	3.5
Training	8.7	14.5	2.7	9.0	-	-	5.6
Information	1.1	0.4	4.6	0.6	5.0	1.6	-
Research Expenses	16.3	14.9	16.9	13.4	65.1	23.7	14.2
Supporting Services (Overhead)	3.3	7.1	-	-	-	-	4.5
Other	1.0	-	-	-	-	-	6.8
Total Operating costs	75.9	91.0	66.9	70.0	89.2	64.9	85.7
Field Equipment	2.6	3.6	4.5	-	-	10.8	-
Laboratory	2.7	3.9	3.2	-	-	12.6	-
Other	10.9	1.1	17.8	-	-	3.1	-
Total Capital costs	16.2	8.6	25.5	23.8	10.8	26.4	12.2
Contingency	2.5	0.7	7.6	6.2	-	8.7	2.0
TOTAL IDRC GRANT COSTS	100	100	100.0	100	100	100	100

Table III: Cost Breakdown of AFNS Projects Overseas by Geographical Region

(a) 1972/73	Asia	Africa & Middle East	Latin America and Caribbean
IDRC Staff	43.2	25.3	36.9
Consultant	5.3	1.4	1.8
Senior Research Staff	-	5.0	3.3
Other Staff	7.9	12.3	9.4
Travel	10.1	5.5	1.6
Training	-	7.4	19.1
Information	2.9	1.2	0.1
Research Expenses	16.6	19.6	9.2
Supporting Services (Overhead)	-	2.51	3.8
Other	-	-	0.4
Total Operating Costs	85.9	81.0	86.0
Field Equipment	-	.4	-
Laboratory	-	.3	-
Other	-	12.2	-
Total Capital Costs	5.4	12.9	10.1
Contingency	8.6	6.3	3.8
TOTAL IDRC GRANT COSTS	100	100	100

Table III: Cost Breakdown of
AFNS Projects Overseas by Geographical Region

(b) 1973/74

	Asia	Africa & Middle East	Latin America and Caribbean
IDRC Staff	11.6	29.9	-
Consultant	1.4	1.5	5.0
Senior Research Staff	13.2	10.2	18.2
Other Staff	19.8	0.9	10.5
Travel	9.4	6.9	5.3
Training	12.4	1.5	8.8
Information	0.5	3.3	2.4
Research Expenses	11.5	27.2	13.9
Supporting Services (Overhead)	5.7	-	-
Other	1.7	-	-
Total Operating Costs	88.9	81.4	64.1
Field Equipment	2.1	6.0	-
Laboratory	3.4	2.7	1.6
Other	0.2	1.6	-
Total Capital Costs	10.7	14.3	29.3
Contingency	1.4	4.2	6.6
TOTAL IDRC GRANT COSTS	100	100	100

Table IV: Cost Breakdown of AFNS Projects Overseas by Size of Grant

(a) 1972-73

	50,000 or less	50,000 - 200,000	200,000 - 500,000	500,000 and over
IDRC Staff	87.1	20.7	24.7	37.3
Consultant	-	2.3	-	-
Senior Research Staff	-	6.3	5.9	2.7
Other Staff	-	18.2	-	7.4
Travel	3.1	8.2	4.4	0.8
Training	-	5.6	2.0	18.9
Information	-	1.5	-	0.7
Research Expenses	8.4	17.7	41.2	11.4
Supporting Services (Overhead)	-	2.7	-	3.9
Other	-	-	-	-
Total Operating Costs	98.6	83.2	78.3	83.0
Field Equipment	-	-	-	-
Laboratory	-	-	-	-
Other	-	-	-	-
Total Capital Costs	1.4	13.5	14.3	10.2
Contingency	-	3.6	7.4	6.7
TOTAL IDRC GRANT COSTS	100	100	100	100

Table IV: Cost Breakdown of
AFNS Projects Overseas by Size of Grant

(b) 1973/74

	50,000 or less	50,000 - 200,000	200,000 - 500,000	500,000 and over
IDRC Staff	-	17.7	3.5	23.5
Consultant	-	2.1	1.7	02.2
Senior Research Staff	30.4	12.3	19.0	14.4
Other Staff	-	7.5	19.8	15.8
Travel	10.2	7.7	3.6	22.0
Training	-	3.0	6.6	0.9
Information	25.4	2.0	0.8	15.9
Research Expenses	16.2	22.7	15.4	-
Supporting Services (Overhead)	-	-	8.5	--
Other	-	-	2.6	-
Total Operating Costs	59.4	75.9	81.6	95.0
Field Equipment	-	4.9	0.8	3.7
Laboratory	33.0	1.7	4.1	1.4
Other	-	11.4	11.2	-
Total Capital Costs	33.0	18.0	16.1	5.1
Contingency	7.6	5.3	2.3	-
TOTAL IDRC GRANT COSTS	100	100	100	100